Claims

1. A method for producing chromates characterized in that it includes: the chromite ore is decomposed with oxidant in the molten salt or in aqueous solution of alkali metal hydroxide, the leaching slurry is obtained via leaching of the reaction products with aqueous solution, and the primary chromate products are separated from the leaching slurry; the method comprises following steps:

(1) Chromite ore decomposing. A mixture of alkali metal hydroxide, alkali metal chromate, and ferrous residue can be obtained after the reaction of chromite ore with oxidant in the reactor in the molten salt or in aqueous solution of alkali metal hydroxide; the weight of the alkali metal hydroxide used is two to eight times as much as that of the chromite ore used; the amount of the oxidant is either equal to or above the stoichiometric amount for decomposing chromite ore; the water amount in the reaction system is in the range from 0 to 50% by weight of the total amount of all reactants; the reaction temperature is in the range from 200 to 500 ℃; the reaction time is in the range from 1 to 20 hours;

(2) To obtain a kind of slurry with an alkali metal hydroxide content of 30% to 70% by weight by leaching the mixture obtained in Step (1) with an aqueous solution of alkali metal hydroxide with a concentration range from 0 to 30% by weight;

(3) To separate the leaching slurry obtained in Step (2) and obtain respectively primary alkali metal chromate product, ferrous residue, and alkali liquor.

2. A method for producing chromates as claimed in Claim 1, wherein it also includes the purification of the primary chromate products to manufacture pure chromate crystal. It is carried out according to the following steps:

(4) To dissolve the primary chromate products obtained in Step (3) in aqueous solution and obtain chromate aqueous solution;

(5) To adjust the pH value of the chromate aqueous solution obtained in Step (4) to the range from 3 to 9 with acidifying agent, filter out the precipitates, and obtain pure chromate aqueous solution;

(6) To heat the pure chromate aqueous solution to evaporate the water and obtain pure chromate crystal and mother liquor after crystallizing, filtering, and drying.

3. A method for producing chromates as claimed in Claim 1, wherein the said oxidant

in Step (1) includes air, oxygen, sodium nitrate, potassium nitrite, sodium peroxide, potassium peroxide, or mixtures thereof.

4. A method for producing chromates as claimed in Claim 1, wherein the said alkali metal hydroxide in Step (1) includes the alkali metal hydroxide recycled from Step (3), the alkali metal hydroxide supplemented, or mixtures thereof.

5. A method for producing chromates as claimed in Claim 1, wherein the said alkali metal hydroxide in Steps (1) and (2) is sodium hydroxide or potassium hydroxide.

6. A method for producing chromates as claimed in Claim 1, wherein it includes the alkali metal hydroxide aqueous solution obtained in Step (1) as alkali liquor and recycled to Step (1) to decompose the chromite ore.

7. A method for producing chromates as claimed in Claim 2, wherein the said aqueous solution in Step (4) includes sodium hydroxide or potassium hydroxide aqueous solution with the concentration range from 0 to 20% by weight.

8. A method for producing chromates as claimed in Claim 2, wherein the said acidifying agent in Step (5) includes inorganic acid, acidic gas, chromium anhydride, sodium dichromate, potassium dichromate, sodium bicarbonate, potassium bicarbonate, sodium bisulfate, or potassium bisulfate; the said inorganic acid includes sulfuric acid, hydrochloric acid, or nitric acid; the said acidic gas includes carbon dioxide or sulfur dioxide.

9. A method for producing chromates as claimed in Claim 2, wherein it also includes the aqueous solution obtained as the mother crystallization liquor in Step (6) and recycled to Step (4) to dissolve the primary chromate product.